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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/804,174

03/19/2004

Toshiaki Okuno

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6746

20277

7590

05/04/2006

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EXAMINER

LEE, JOHN D

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/804,174

Applicant(s)

OKUNO ET AL.

Examiner

John D. Lee

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply.

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-18 and 20-27 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-18 and 20-27 is/are allowed.
- 6) ☒ Claim(s) 11-13 and 15 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0106</u> . | 6) <input type="checkbox"/> Other: _____  |

Applicant's amendment, filed on March 8, 2006, has been carefully considered by the Examiner. Applicant's amendments have overcome the objections to the specification and claim 27. The amendments have also placed many of the claims in allowable condition. The rejections of claims 11-13 and 15 are, however, maintained for the reasons set forth below.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-13 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by published European Patent Application EP 1 209 497 A2 to Hirano et al. Hirano et al discloses wavelength converters which are formed from nonlinear optical fibers, and discloses many embodiments of optical fibers which are suitable for use. In Figure 14 of Hirano et al, optical fiber "E6" has a chromatic dispersion whose absolute value in the general wavelength range specified by applicant is 0.18 (ps/km/nm), a nonlinear coefficient of 21.7 (1/W/km), and a transmission loss of 0.47 dB/km at 1550 nm. The optical fiber wavelength converters of Hirano et al are optically pumped.

Claim 11 is further rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 5,960,146 to Okuno et al. Okuno et al discloses wavelength converters

(i.e. four wave mixers) which are formed from nonlinear optical fibers, and discloses many embodiments of optical fibers which are suitable for use. In column 19 (EXAMPLE 9), Okuno et al discloses an optical fiber which has a chromatic dispersion whose absolute value in the general wavelength range specified by applicant is 0.2 (ps/km/nm). The optical four wave mixers of Okuno et al are optically pumped.

Claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over published European Patent Application EP 1 209 497 A2 to Hirano et al. Hirano et al does not specifically disclose the presence of a blocking filter at the output of the optical wavelength converter for blocking the pumping (input) wavelength which may have propagated through the optical fiber. Since this is common practice in the optical wavelength conversion art, the presence of such a filter in any of the Hirano et al embodiments (including the Figure 14 "E6" embodiment) would have been obvious to the person of ordinary skill in the art.

Claims 12, 13, and 15 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,960,146 to Okuno et al. Okuno et al does not specifically disclose the presence of a blocking filter at the output of each four wave mixer embodiment for blocking the pumping (input) wavelength which may have propagated through the optical fiber. Such a filter is clearly suggested, however, by Figure 42 of Okuno et al, which figure shows several optical filters being positioned at the output of the optical wavelength converting four wave mixer. The presence of a filter for blocking the pumping wavelength in any of the Okuno et al embodiments would thus have been entirely obvious to a person of ordinary skill in the art. Okuno et al also does not specifically disclose that the optical fiber in the EXAMPLE 9 embodiment referenced

above has a nonlinear coefficient of 10 (1/W/km) or more at 1550 nm, or a transmission loss of 1 dB/km or less at 1550 nm. Since the context presented in the reference with respect to this optical fiber embodiment implies that the fiber will have a high optical nonlinearity and a low optical loss, the values for these parameters set forth in applicant's claims would have been obvious in Okuno et al for the person of ordinary skill in the art.

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Hirano et al and Okuno et al, the most relevant prior art of record, fail to disclose or reasonably suggest any threshold for the occurrence of Stimulated Brillouin Scattering (SBS) in the optical fibers thereof.

Claims 16-18 and 20-27 are allowable over the prior art of record. As just noted, Hirano et al and Okuno et al, the most relevant prior art of record, fail to disclose or reasonably suggest any threshold for the occurrence of Stimulated Brillouin Scattering (SBS) in the optical fibers thereof. The Examiner also agrees with applicant that neither Hirano et al nor Okuno et al disclose or reasonably suggest a pumping light source in which a wavelength of the pumping channel is tunable.

The prior art submitted by applicant in the Information Disclosure Statement received on January 20, 2006, has been considered and made of record. Note the attached initialed copy of form PTO-1449.

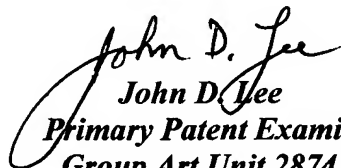
Applicant's arguments submitted with the response of March 8, 2006, have been considered but are not deemed to be persuasive. With respect to the 35 U.S.C. § 102(b) rejection of claims 11-13 based on Hirano et al, applicant admits that fiber E6 in Figure 14 of the reference has a chromatic dispersion whose absolute value in the general

wavelength range specified by applicant is 0.18 (ps/km/nm), but argues that fiber E6 cannot satisfy the features of the fiber of claim 11 because it has a dispersion slope of 0.045 ps/nm<sup>2</sup>/km. This argument is totally misplaced and non-persuasive, however, since a value for dispersion slope is not anywhere mentioned in claim 11. Fiber “E6” of Hirano et al does indeed disclose each and every limitation of applicant’s claims 11-13. With respect to the 35 U.S.C. § 102(b) rejection of claim 11 based on Okuno et al, applicant argues that the EXAMPLE 9 optical fiber therein cannot satisfy the features of the fiber of claim 11 because it has a dispersion slope of 0.035 ps/nm<sup>2</sup>/km, even though it meets the claim limitation of chromatic dispersion having an absolute value in the general wavelength range specified by applicant of 0.2 (ps/km/nm) or less. This argument is likewise totally misplaced and non-persuasive, since a value for dispersion slope is not anywhere mentioned in claim 11. With respect to the 35 U.S.C. § 103(a) rejection of claim 15 based on Hirano et al, and the 35 U.S.C. § 103(a) rejection of claims 12, 13, and 15 based on Okuno et al, applicant does not specifically argue the points of obviousness raised by the Examiner. Applicant rather incorporates “the arguments previously advanced in traversing the imposed rejection of claim 11 under 35 U.S.C. § 102 for lack of novelty as evidenced by each of Hirano et al and Okuno et al”, adding that “The Examiner’s additional comments do not cure the previously argued deficiencies of Hirano et al and Okuno et al”. Since the 35 U.S.C. § 102 arguments have been fully answered by the Examiner, no further comments are deemed necessary.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE (3) MONTHS from the mailing date of this action. In the event a first reply is filed within TWO (2) MONTHS of the mailing date of this final action and an advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 C.F.R. § 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX (6) MONTHS from the mailing date of this action.

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562, to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.

  
**John D. Lee**  
**Primary Patent Examiner**  
**Group Art Unit 2874**